REMARKS

This AMENDMENT under 37 C.F.R. §1.116 is filed in reply to the outstanding Office Action of September 15, 2004, and is believed to be fully responsive thereto for reasons set forth below in greater detail.

Initially, entry of this AMENDMENT under 37 C.F.R. §1.116 is requested as it merely changes "into" to --with-- in Claim 2, line 7, to clarify the claim language, and does not affect the scope of Claim 2 at all. A similar revision, changing "into" to --with-- was made in the previous AMENDMENT to Claim 2, line 10, in response to a previous rejection under 35 USC §112.

Reconsideration is respectfully requested of the rejection of Claims 2 and 12 under 35 USC §112.

Initially, the following statement appears to indicate a lack of understanding of the present invention. "Specific to Claims 2 and 12, line 1, the preamble recites a method for analyzing the data structure of a target array while the body of the claim recites steps for changing a variable that is included in a target array."

It should be pointed out that in the present invention, the data structure of a target array, such as DNA or RNA, an array of four bases, page (p.) 2, lines (l.) 25-32, is analyzed by changing the array to a more generic form of the array more suitable for analysis. This is explained at p. 4, l. 3-9, and p. 5, l. 8-20, as follows, and by other examples in the specification.

"For a gene sequence, such as a DNA or RNA base array, a specific element in the array may be exchanged with another specific element (for example, the A (adenine) and T (thymine) or the G (guanine) and C (cytosine) of DNA complement each other and can be exchanged). Thus, in a parameterized suffix tree, when replaceable elements of an array are employed as variables, and when by replacing these variables in character strings (the character strings that include the variables) the character strings can be altered so that they are the same, the character strings are regarded as being the same."

"For a gene sequence, such as a DNA or RNA base array, it is well known that although arrays that have the same structure may have different appearances they tend to have the same functions or properties. For a DNA base array, for example, when either or both of the complementary A and T, and the complementary G and C components are exchanged with each other, or when the non-complementary A and C components are exchanged and the non-complementary T and G components are exchanged, the structure of the array (the relationship of the elements of the array) tends to be unchanged, even though the array differs from the original array, and the functions and the properties obtained by effecting the exchange tend to be similar to those of the original array. Therefore, when analyzing a gene sequence, it is extremely important that arrays having the same structure be defined as the same array, regardless of whether the array themselves are identical, and that a frequently appearing array be extracted or that a partial array commonly included in two arrays be searched for."

The rejection under 35 USC §112 based upon the term "target array" is also not well based, and appears to be directed more toward the breadth of the claim than to a proper basis under 35 USC §112. The specification refers to a number of different target arrays that are well known in the art: DNA, RNA, p. 1, l. 25-29; character string, p. 1, l. 30 to p. 2, l. 6; suffix array, p. 3, l. 14-22; parameterized string, p. 4, l. 11-19; complementary array, p. 7, l. 4-11; non-complementary array, p. 7, l. 25-30. These arrays are all well known in the art and are referred to in the art as arrays. Accordingly, the definition in Claims 2 and 12 of the "target array consisting of a plurality of different characters" is believed to be consistent with art-recognized and well known terms of art and in full compliance with 35 USC §112.

Reconsideration is respectfully requested of the rejection of Claims 2 and 12 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,369,577 issued to Kadashevich, et al. (Kadashevich).

The patent to Kadashevich discloses and teaches a morphological analyzer and search engine that searches a collection of words that are based upon the input of a word to initiate the search. Kadashevich further teaches that the apparatus comprises a means for generating a first set of words, wherein the first set of words contains member words that are lexically related to the input word. Also disclosed is a search engine that searches a collection of words in order to detect the occurrence of any of the words from a group of search words, the group of search words including the input word and the first set of words.

Kadashevich refers to: a first set of words containing members that are lexically related to the input word, column (c.) l. 57-58; stripping suffixes from a word, c. 2, l. 2-4; parsing an input word to identify stems, c. 2, l. 16-17; a thesaurus database to generate a group of synonyms, c. 2, l. 33-38; a second group of words of synonyms with added suffixes, c. 2, l. 38-42; a first group of suffixes including inflectional and derivational suffixes, c. 3, l. 5-6; a second group of suffixes including suffixes that do not substantially change the meaning of words, c. 3, l. 14-17; conducting a morphological analysis of an input word form the root to the suffix, c. 3, l. 56-57; a topic structure 124 including a field 119 for an array of pointers and a field 117 for the number of bases within the array, c. 8, l. 25-31; traversing the lexicon tree, c. 23, l. 57-61, c. 25, l. 35 to c. 26, l. 42.

However, Kadashevich does not disclose or teach the following limitations of Claims 2 and 12.

The following analysis of the breadth of Claims 2 and 12 is given to demonstrate that the claims are in fact reasonably limited and do not read on the prior art, including Kadashevich.

Claims 2 and 12 are very similar structurally and in limitations, differing only slightly in language, and include paragraph (a) directed to generating a first array and paragraph (b) directed to generating a second array. Moreover, paragraphs (a) and (b) are also very similar in limitations, with paragraph (b) being specifically directed to a complementary array. Accordingly, the following analysis of Claim 2 is also representative of Claim 12.

Claim 2 will be read on the character string array of p. 11, l. 11-19, and the complementary string array of p. 7, l. 4-11 as follows.

As explained on p. 4, l. 11-19, in the particular examples of character string arrays, x, y and z are defined as variables, a, b and c are defined as fixed characters, and the variables x, y and z are exchanged. A zero (0) represents the first appearance of a variable, and a numerical value represents the distance from a variable to the same variable that appeared immediately upstream/before.

Thus, in the exemplary character string arrays, p. 4, l. 18-19, prev (axbycxaza) = prev (az (z exchanged for x) bx (x exchanged for y) cz (z exchanged for x) ay (y exchanged for z) a) = a0b0c4a0a, with the explanation = a0 (first appearance of x (first array) or z (second array)) b0 (first appearance of y (first array) or x (second array)) c4 (distance from previous appearance of x or z) a0 (first appearance of z (first array) or y (second array)) a.

Bearing these explanations in mind, Claim 2, paragraph (a), can be read on the above exemplary array as follows.

"(a) generating a first array having elements corresponding to the elements of the target array, including the steps of:

(i) traversing said target array (from left to right in the example array) and replacing a variable in the first array that corresponds to a variable that is included in the target array with information that represents a location of the same variable if it is present upstream

with respect to said variable (in the example, 4 is the distance to the first appearance of x or z) when the target array is traversed along a path extending in a predetermined direction;

(ii) replacing said variable in the first array with information that indicates if that said same variable is not present upstream with respect to the said variable (a 0 represents the first appearance of a variable); and

(iii) repeating steps (i)-(ii) for all the other variables included in the target array (repeated for each variable x, y and z)."

As explained on p. 7, l. 4-11, in the particular exemplary character string, x, y and z are variables, A and B are fixed characters, the variable x and the variable z are complementary variables, and the variable y and the variable w are complementary variables. A 0 represents the first appearance of a variable, and a numerical value represents the distance from a variable to the same variable that appeared immediately upstream/before. Thus, in the exemplary character string arrays, compl (AbxByAzwz) = AB0B0A436, with the explanation = AB0 (first appearance of x) B0 (first appearance of y) A4 (distance from previous appearance of x, the complement of z) 3 (distance from previous appearance of y, the complement of w) 6 (distance from previous appearance of x, the complement of z)."

Bearing these explanations in mind, Claim 2, paragraph (b), can be read on the above complementary array as follows.

"(b) generating a second array having elements corresponding to the elements of the target array, including the steps of:

(i) traversing said target array (from left to right in the example array) and replacing a variable in the second array that is included in the target array with information that represents a location of said variable with respect to a different complementary variable present upstream with respect to said variable (4 is the distance from the previous appearance of x, the complement of z, 3 is the distance from the previous appearance of y, the complement of w, 6 is the distance from the previous appearance of x, the complement of z) when the target array is traversed along a path extending in a predetermined direction;

(ii) replacing said variable in the second array with information that indicates if no other different complementary variable is present upstream with respect to said variable (0 represents the first appearance of x and then y); and

(iii) repeating steps (i)-(ii) for all the other variables included in the target array (repeated for each variable x, y and z)."

The Examiner attempts to read Claims 2 and 12 on Kadashevich by reading the target array as a word made up of a string of characters, the first array as members of inflectional suffixes, and the second array as elements that relate (correspond) to the target elements.

Referring first to Claim 2, paragraph (a), Kadashevich does not replace a variable in the first array with information that represents a location of the same variable present upstream with respect to that variable, and does not replace a variable in the first array with information that indicates that the same variable is not present upstream.

Similarly, Kadashevich does not disclose or teach the same limitations of Claim 2, paragraph (b), and in addition has no disclosure or teaching of replacing the same variables of the previous paragraph for complementary variables, and therefore does not disclose or teach generating a second array by replacing a variable that represents a location of a different complementary variable present upstream with respect to the replaced variable, and does not replace a variable in the first array with information that indicates that the same variable is not present upstream.

In view of the above, it is respectfully submitted that this application is in condition for allowance. Accordingly, it is respectfully requested that this application be allowed and a Notice of Allowance issued. If the Examiner believes that a telephone conference with Applicant's attorneys would be advantageous to the disposition of this case, the Examiner is requested to telephone the undersigned.

Respectfully submitted,

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